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Myxobolus vanivilasae n.sp. parasitic in *Cirrhina mrigala* (Hamilton)*

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Abstract. A new species of myxosporidan, *Myxobolus vanivilasae* n. sp. infecting the fry and fingerlings of cultivable fish *Cirrhina mrigala* (Hamilton) is described.

Keywords. *Myxobolus vanivilasae* n.sp.; *Cirrhina mrigala.*

1. Introduction

Myxosporidans are important Cnidosporan parasites infecting almost all the organs of fish with cosmopolitan distribution. The species of the genus *Myxobolus* have been recorded from Indian fishes (Tripathi 1953; Bhatt and Siddiqui 1964; Chaudhuri and Chakravarty 1970; Karamchandani 1970; Seenappa and Manohar 1980). In the present paper yet another species infecting the cultivable freshwater fish, *Cirrhina mrigala*, has been reported.

2. Materials and Methods

All the organs of live and formalin (5%) preserved mrigal fry and fingerlings were examined for the parasite cysts. The colour, shape and size of the cysts were recorded. The cysts were burst and the spores were examined live or in air-dried smears stained with Giemsa, Wright's or Delafield's-hematoxyline stains. For demonstrating the presence of an iodinophilous vacuole the air-dried and wet smears were treated with Lugol's iodine for 5 min. For polar filament extrusion live spores were treated with 0·01–2·0% concentration of calcium, potassium and sodium hydroxides, 30% H_2O_2 and saturated aqueous urea. The morphometric data pertaining to the spore and its organelle were recorded at 2000 magnification. Drawings were made with the aid of a camera-lucida.

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3. Results

Parasite : *Myxobolus vanivilasae* n. sp.
Host : *Cirrhina mrigala* (Hamilton).
Locality : Farm ponds of Department of Fisheries at Vanivilas Sagar, Hiriyur Taluk, Chitradurga District, Karnataka State.

Date : 15 September 1977.
Type designation : Syntype.
Type deposition : Museum of the Zoological Survey of India, Calcutta.

The white cysts were found below the scales, on the lips of both jaws, the chin, sides of the mouth, posterior part of the buccal cavity, the eye orbit and musculature below the skin (figure 1). Excepting the scales, at all other sites only few cysts were observed. The developing cysts were more or less oval or round, while the fully matured ones were triangular in shape (*viz.* shape of scale). The size of the cysts ranged from $0{\cdot}45 \times 0{\cdot}33$ mm – $2{\cdot}18 \times 1{\cdot}95$ mm.

The spores treated for 42 days with hydroxides polar filament extrusion was noted in less than 10%, while hydrogen peroxide did not give consistent results. The urea solution which was found comparatively better in that extrusion was 30–40%.

The spores, ovate in front view and lenticular in side view (figure 2); anterior end of spore slightly wider than the posterior. The shell valves moderately thick smooth and symmetrical; sutural ridge well-developed but sutural line not clear; polar capsules convergent, pyriform, equal or unequal (40%), enclosing coiled polar filaments; the extruded filaments unequal; small triangular intercapsular ridge between the openings of the two capsules: the nuclei of the polar capsules fairly big, triangular and situated near the posterior end of the capsules; the sporoplasm shield shaped with three pointed ridges at the anterior side occupying most of the extra-capsular space; a prominent round, ovoidal or bean-shaped iodinophilous vacuole inside the sporoplasm; small sporoplasm nuclei anterior to the iodinophilous vacuole.

The measurements of live spores and Giemsa, Wright's and Delafield's hematoxylin-eosin stained spores are given in table 1 and their length frequencies are given in figure 3.

4. Discussion

The present species is placed in the genus Myxobolus (Butschli 1882) on the basis of spore structure and the presence of an iodinophilous vacuole. In size and shape the spore closely resembles *Myxobolus mrigalae* (Chakravarty 1939) and *Myxobolus sphericum* (Tripathi 1953), found below the scales of *Cirrhina mrigala*, as well as *Myxobolus lairdi* (Moser and Noble 1977) described from the eye and brain of *Coryphaenoides rupestris*. But it differs from *M. mrigalae* in the size of the polar capsule, in having an intercapsular ridge and absence of thickenings on the sutural ridge; from *M. sphericum* in the shape of the polar capsule and absence of thickenings on the sutural ridge and from *M. lairdi* in possessing an intercapsular ridge. Further, the present species differs from the above three species in the sites of infection.

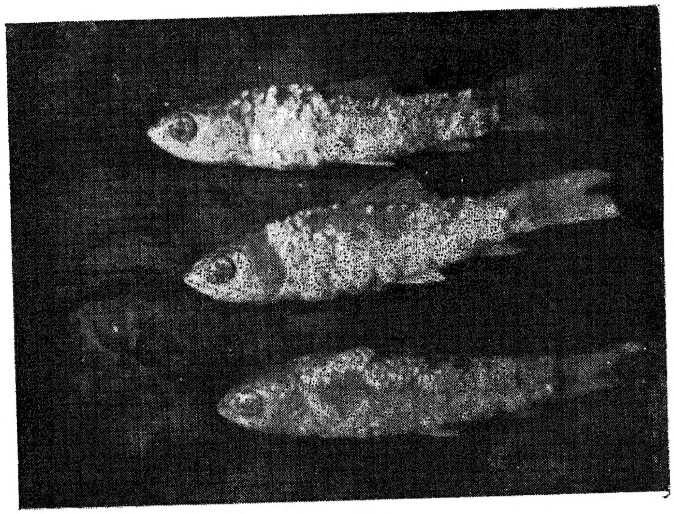

Figure 1. *Cirrhina mrigala* fingerlings infected with *M. vanivilasae.*

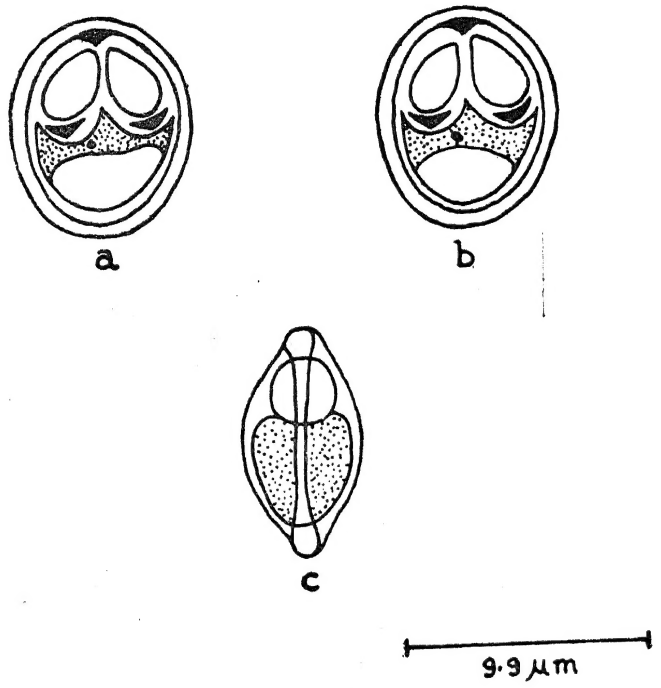

Figure 2. Spore diagram (camera lucida). (a) Front view of the spore with equal polar capsule. (b) Front view of the spore with unequal polar capsule. (c) Sutural view.

Since, Walliker (1968) suggested that the presence or absence of iodinophilous vacuole cannot be regarded as a character for determining the genera *Myxosoma* and *Myxobolus*, the present species was also compared with *Myxosoma squamalis* (Iversen 1954) infecting the scales of *Salmo gairdneri*, *Oncorhynchus tschawyt-*

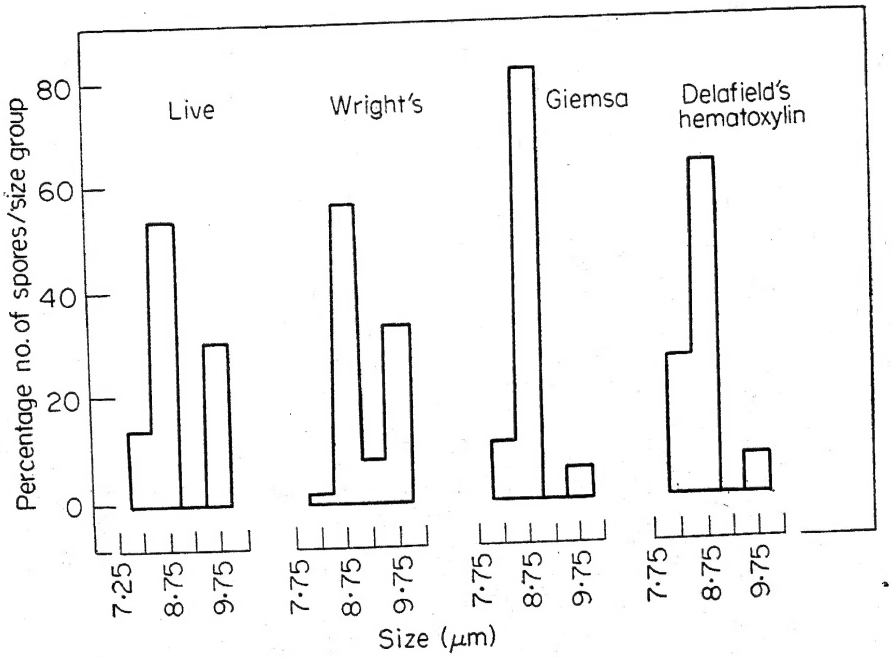

Figure 3. Length frequency distribution.

Table 1. Measurements of live and stained spore of *Myxobolus vanivilasae* n. sp. (μm).

Preparation (number of spores measured)	Length	Breadth	Thickness	Polar capsule		Polar filament length	Sporoplasm	Iodinophilous vacuole
				Unequal	Equal			
				Mean (range)	Mean (range)			
Live (50)	8–10	7–9	4–6·5	3·54 × 2·57 (3–4 × 2–3) 2·98 × 2·59 (2·5–3·5 × 2–3)	3·18 × 2·32 (3–4 × 2–2·5)	24·6–49 and 18·6–29	Sporoplasm margins not clear	2–3 × 3–4
Wright's stain (100)	8–10	7–9	..	3·57 × 2·18 (3–4 × 2–3) 2·83 × 2·15 (2–3·5 × 2–3)	3 × 2 (3–4 × 2–3)		3·5 × 4–6·5	
Giemsa stain	8–10	7–9	..	3·56 × 2 (3–4 × 2–2·5) 2·84 × 2 (2–3·5 × 2–2·5)	3 × 2 (3–4 × 2–2·5)		3–4 × 4–6	
Delafield's hematoxylin-eosin stain (30)	8–10	7–8	..	3·33 × 2 (3–4 × 2) 2·33 × 2 (2–3 × 2)	3·19 × 2 (3–4 × 2)		3–4 × 4–5	

scha and *O. keta*, which resembles in size and shape; but differs from it in having an intercapsular ridge and in the absence of narrow parallel ridges on either side of the sutural ridge.

The present species also differs from *Myxobolus aligarhensis* and *M. ophicephali* (Bhatt and Siddiqui 1964), *M. punctatus* (Chaudhuri and Chakravarti 1970), *M. batae* (Karamchandani 1970), *M. carnaticus* and *M. curmucae* (Seenappa and Manohar 1980) as well as from *Myxosoma intestinalis* (Narasimhamurthi 1970) and *Myxosoma lairdi* (Narasimhamurthi and Kalavati 1979) in several of the morphological characters.

In view of the above differences we regard the present species as new taxon and name it as *Myxobolus vanivilasae* after her Highness Srivani Vilasa Sannidhana who was responsible for the construction of Vanivilasa Sagar dam.

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